UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/711,155	11/13/2000	James M. Clark	0918.0041C	6772

7590 02/11/2004

Epstein Edell Shapiro & Finnan LLC
1901 Research Boulevard
Suite 400
Rockville, MD 20850-3164

EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/711,155	CLARK, JAMES M.	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *November 13th, 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 21-30* is/are rejected.

7)☒ Claim(s) *12-20 and 31-45* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *November 13th, 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *1*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Claims 1-to-45 are pending in the application.

Specification

2. The disclosure is objected to because of the following informalities:

   - On Page 4, lines 18 & 20, the use of the word "relatively" does not clearly disclose the improvement in the detection of the long code.
   - On Page 5, line 7, the specification discloses the word "aforesaid", it is not clear what the word describes.

   Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

   A person shall be entitled to a patent unless –

   (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2 & 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Sato (6,574,205).

Regarding to Claims 1, 2 & 4, Sato discloses a method of detecting a long code from two shorter codes further comprising detecting the two shorter codes and based on the two shorter codes determining the synchronization of the long code (Column 1, lines 60-67 & Column 2, lines 1-16 & Column 3, lines 49—57 & Column

5, lines 18-26). Sato further discloses that the long code is composed of symbols of the two shorter codes interleaved with one another (Column 3, lines 25-42 & Column 4, lines 49-59). Sato also discloses the two shorter codes to be pseudonoise (PN) codes (Column 3, lines 25-42).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3 & 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (6,574,205) in view of L.B. Milstein et al. (Combination Sequences for Spread Spectrum Communications; IEEE Transactions on Communications; July 1977; Pages 691-696).

Regarding to Claims 3 & 5-7, Sato discloses a method of detecting a long code from two shorter codes further comprising detecting the two shorter codes and based on the two shorter codes determining the synchronization of the long code as described above. However, Sato does not disclose one of the shorter codes to be "n" symbols long and the other short code being "m" symbols long and furthermore "m" is greater than "n" and are mutually prime and m=m+1.

Milstein discloses a spread spectrum communication technique supporting multiple users implementing long codes to avoid jamming, but reduces the acquisition time associated with dispreading long codes, by implementing the long

codes as combination sequences (Abstract, lines 1-7). Milstein further discloses the shorter sequences are chosen to be prime (Introduction, Page 691, Column 1, lines 7-21). Milstein further discloses the shorter sequences to be of different lengths (Introduction, Page 691, Column 2, lines 45-50 & Simulation Results, Page 693, Column 1, lines 13-19, 30-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Milstein teaches that the shorter codes of different symbol sizes and mutually prime can be implemented to comprise a long code in a spread spectrum system as described in Sato and that the shorter code repeat within a period of the long code. Furthermore it is a matter of design choice to implement the shorter sequences such that "m=n+1" where "m" and "n" being the shorter sequence sizes, and there is not criticality in such a selection. Furthermore it is also a matter of design choice to selecting the shorter codes such that the difference between them is of only one symbol.

7. Claims 8-11 & 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (6,574,205) in view of L.B. Milstein et al. (Combination Sequences for Spread Spectrum Communications; IEEE Transactions on Communications; July 1977; Pages 691-696) in further view of Fukawa et al. (5,790,588).

Regarding to Claims 8-11, Sato discloses a method of detecting a long code from two shorter codes further comprising detecting the two shorter codes and based on the two shorter codes determining the synchronization of the long code (Column 1, lines 60-67 & Column 2, lines 1-16 & Column 3, lines 49—57 & Column 5, lines 18-26). Sato further discloses that the long code is composed of symbols of the two

shorter codes interleaved with one another (Column 3, lines 25-42 & Column 4, lines 49-59). Sato also discloses the two shorter codes to be pseudonoise (PN) codes (Column 3, lines 25-42). However, Sato does not disclose one of the shorter codes to be "n" symbols long and the other short code being "m" symbols long.

Milstein discloses a spread spectrum communication technique supporting multiple users implementing long codes to avoid jamming, but reduces the acquisition time associated with dispreading long codes, by implementing the long codes as combination sequences (Abstract, lines 1-7). Milstein further discloses the shorter sequences are chosen to be prime (Introduction, Page 691, Column 1, lines 7-21). Milstein further discloses the shorter sequences to be of different lengths (Introduction, Page 691, Column 2, lines 45-50 & Simulation Results, Page 693, Column 1, lines 13-19, 30-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Milstein teaches that the shorter codes of different symbol sizes and mutually prime can be implemented to comprise a long code in a spread spectrum system as described in Sato. However Sato in view of Milstein does not disclose the method to comprise demultiplexing the received signal, correlating the first and second streams with the first and second reference codes respectively, summing the correlation signals and processing the summed correlation to determine the phase of the long code.

Fukawa discloses a receiving apparatus employing composite spreading codes used in a spread spectrum communication system (Abstract, lines 1-14 & Column 1, lines 5-12 & Fig. 6). The receiver comprises a hybrid circuit (Fig. 6, element 31),

which receives the spread baseband and splits the signal into two streams (Column 8, lines 23-26), a correlator (Fig. 6, element 32A1) for correlating the first stream with the first reference code (Fig. 6, element 33s), and a second correlator (Fig. 6, element 32B2) for correlating the second stream with the second reference code (Fig. 6, element 33L) to produce a first and second correlated signals. The receiver further comprises summing devices (Fig. 6, element 351 & 352) to sum the sequence of first and second correlated signals over a first and second predetermined length (Column 2, lines 25-35 & Fig. 19) and further processing (Fig. 6, element 40) the first and second correlation sums to produce a synchronized code (Column 8, lines 23-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the receiver comprising the elements (method) as described in Fukawa into the detecting system as described in Sato in view of Milstein on would be able to detect the long code composed of the shorter codes. Furthermore, Fukawa teaches that the summation of the correlated signals depends on the length of the spreading codes so as to produce an accurate correlator result.

Regarding to Claims 28-30, Sato discloses a method of detecting a long code from two shorter codes further comprising detecting the two shorter codes and based on the two shorter codes determining the synchronization of the long code (Column 1, lines 60-67 & Column 2, lines 1-16 & Column 3, lines 49—57 & Column 5, lines 18-26). Sato further discloses that the long code is composed of symbols of the two shorter codes interleaved with one another (Column 3, lines 25-42 & Column

4, lines 49-59). Sato also discloses the two shorter codes to be pseudonoise (PN) codes (Column 3, lines 25-42). However, Sato does not disclose one of the shorter codes to be "n" symbols long and the other short code being "m" symbols long.

Milstein discloses a spread spectrum communication technique supporting multiple users implementing long codes to avoid jamming, but reduces the acquisition time associated with dispreading long codes, by implementing the long codes as combination sequences (Abstract, lines 1-7). Milstein further discloses the shorter sequences are chosen to be prime (Introduction, Page 691, Column 1, lines 7-21). Milstein further discloses the shorter sequences to be of different lengths (Introduction, Page 691, Column 2, lines 45-50 & Simulation Results, Page 693, Column 1, lines 13-19, 30-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Milstein teaches that the shorter codes of different symbol sizes and mutually prime can be implemented to comprise a long code in a spread spectrum system as described in Sato. However, Sato in view of Milstein does not disclose correlator units, detector units and a processing unit.

Fukawa discloses a receiving apparatus employing composite spreading codes used in a spread spectrum communication system (Abstract, lines 1-14 & Column 1, lines 5-12 & Fig. 6). The receiver comprises a hybrid circuit (Fig. 6, element 31), which receives the spread baseband and splits the signal into two streams (Column 8, lines 23-26), a correlator (Fig. 6, element 32A1) for correlating the first stream with the first reference code (Fig. 6, element 33s), and a second correlator (Fig. 6,

element 32B2) for correlating the second stream with the second reference code (Fig. 6, element 33L) to produce a first and second correlated signals. Fukawa further discloses multiple detector units (Fig. 15, elements 401-404 & Fig. 6 element 43) coupled to the correlators to detect one of the first and second codes (Column 17, lines 9-26) and a processing unit (Fig. 6, element 40) the first and second correlation sums to produce a synchronized code (Column 8, lines 23-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that implementing the receiver comprising the elements (method) as described in Fukawa into the detecting system as described in Sato in view of Milstein on would be able to detect the long code composed of the shorter codes.

8. Claims 21, 22 & 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (6,574,205) in view of Phillips et al. (5,872,810).

Regarding to Claims 21, 22 & 24, Sato discloses a method of detecting a long code from two shorter codes further comprising detecting the two shorter codes and based on the two shorter codes determining the synchronization of the long code (Column 1, lines 60-67 & Column 2, lines 1-16 & Column 3, lines 49—57 & Column 5, lines 18-26). Sato further discloses that the long code is composed of symbols of the two shorter codes interleaved with one another (Column 3, lines 25-42 & Column 4, lines 49-59). Sato also discloses the two shorter codes to be pseudonoise (PN) codes (Column 3, lines 25-42). However, Sato does not disclose a computer-readable medium of instructions for detecting the long code.

Phillips discloses a programmable modem for digital data implemented in an integrated circuit, which can be customized to specific applications (Abstract, lines 1-4 & Column 1, lines 5-15 & Fig. 1, 2). Phillips also discloses the implementation of wide range of applications including spread spectrum techniques on the modem (Column 1, lines 11-40 & Column 3, lines 35-45) with multiple pn-codes (Fig. 6). Philips also discloses the modem to include spreaders, despreaders, up/down converters, filters, correlators and has an interface to external processors for application dependent functionality, the modem is also programmable, allowing for customization of the chip in several application areas (Column 5, lines 5-18 & Fig. 7 & Fig. 11). The modem further provides computer-readable instructions for implementing the customized protocols (Fig. 12, 17, 18 & 21-26). Phillips further discloses that the spreading and despreading registers are fully programmable (Column 14, lines 63-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the programmable modem as described in Phillips can be customized so as t implement the detection algorithm as described in Sato.

9. Claims 23 & 25-27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (6,574,205) in view of Phillips et al. (5,872,810) in further view of L.B. Milstein et al. (Combination Sequences for Spread Spectrum Communications; IEEE Transactions on Communications; July 1977; Pages 691-696).

Regarding to Claims 23 & 25-27, Sato in view of Phillips discloses a method of detecting a long code from two shorter codes further comprising detecting the two

shorter codes and based on the two shorter codes determining the synchronization of the long code in a computer readable medium instructions as described above. However, Sato in view of Phillips does not disclose one of the shorter codes to be "n" symbols long and the other short code being "m" symbols long and furthermore "m" is greater than "n" and are mutually prime and m=m+1 or the specific lengths of the shorter codes.

Milstein discloses a spread spectrum communication technique supporting multiple users implementing long codes to avoid jamming, but reduces the acquisition time associated with dispreading long codes, by implementing the long codes as combination sequences (Abstract, lines 1-7). Milstein further discloses the shorter sequences are chosen to be prime (Introduction, Page 691, Column 1, lines 7-21). Milstein further discloses the shorter sequences to be of different lengths (Introduction, Page 691, Column 2, lines 45-50 & Simulation Results, Page 693, Column 1, lines 13-19, 30-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Milstein teaches that the shorter codes of different symbol sizes and mutually prime can be implemented to comprise a long code in a spread spectrum system as described in Sato in view of Phillips and that the shorter code repeat within a period of the long code. Furthermore it is a matter of design choice to implement the shorter sequences such that "m=n+1" where "m" and "n" being the shorter sequence sizes, and there is not criticality in such a selection. Furthermore it is also a matter of design choice to

selecting the shorter codes such that the difference between them is of only one symbol.

Allowable Subject Matter

10. Claims 12-20 & 31-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. It is recommended to the applicant to amend all the claims so as to be patentable over the prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (703)-305-0341. The examiner can normally be reached (Monday-Friday) from 8:30 AM to 5:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at: (703) 305-4714. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C., 20231
Or faxed to: (703) 872-9314 (for Technology Center 2600 only)
Hand-delivered responses should be bought to: Crystal Park II
2121 Crystal Drive
Arlington, VA., Sixth Floor (Receptionist).

January 29, 2004
Sudhanshu C. Pathak – Examiner Art Unit 2634

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600